

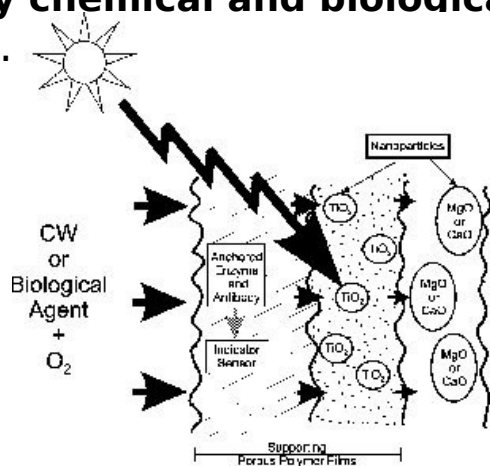


MURI: Photocatalytically Active Nanoscale Scavengers and Sensors for CW and Biological Agents

University of
Pittsburgh



GOAL - Develop a multilayer film structure to simultaneously sense and destroy chemical and biological warfare agents.



Schematic Multilayer Scavenger and Sensor Device

CHALLENGES -

1. Integration of both chemical and biological agent sensors and CB catalysts for their destruction into stable multifunctional films or coatings
2. Efficient photocatalysis in the visible spectrum
3. Integration of the multifunction

DELIVERABLES -

- Polymer-anchored enzyme and antibody scavengers and sensors for CB agents
- Visible-light activated doped-TiO₂ nanoparticles with non-photoreactive porous polymer support catalyzing the destruction of both chemical and biological agents
- Extremely active CaO and MgO and MgO-Cl₂ nanoparticle material for the degradation of CB agents, supported in polymer films.

PRIOR WORK

- University of Pittsburgh research on TiO₂ photocatalysts and polymer anchored enzymes and sensors.
- Kansas State University work on active nanoparticle oxide adsorbents.
- Texas A&M University work on antibody-based scavengers.